

FAA LISTENING SESSION

HAI 2006 – Dallas, TX

Presented to: HAI 2006

By: FAA/Rotorcraft Directorate

Date: February 28, 2006



Federal Aviation
Administration



SESSION OUTLINE

- **Rotorcraft Accident Trends**
- **Night Vision Imaging System (NVIS)**
- **Helicopter Terrain Awareness System (HTAWS)**
- **Health Usage Monitoring System (HUMS)**
- **Listening Session**





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ROTORCRAFT ACCIDENT TRENDS

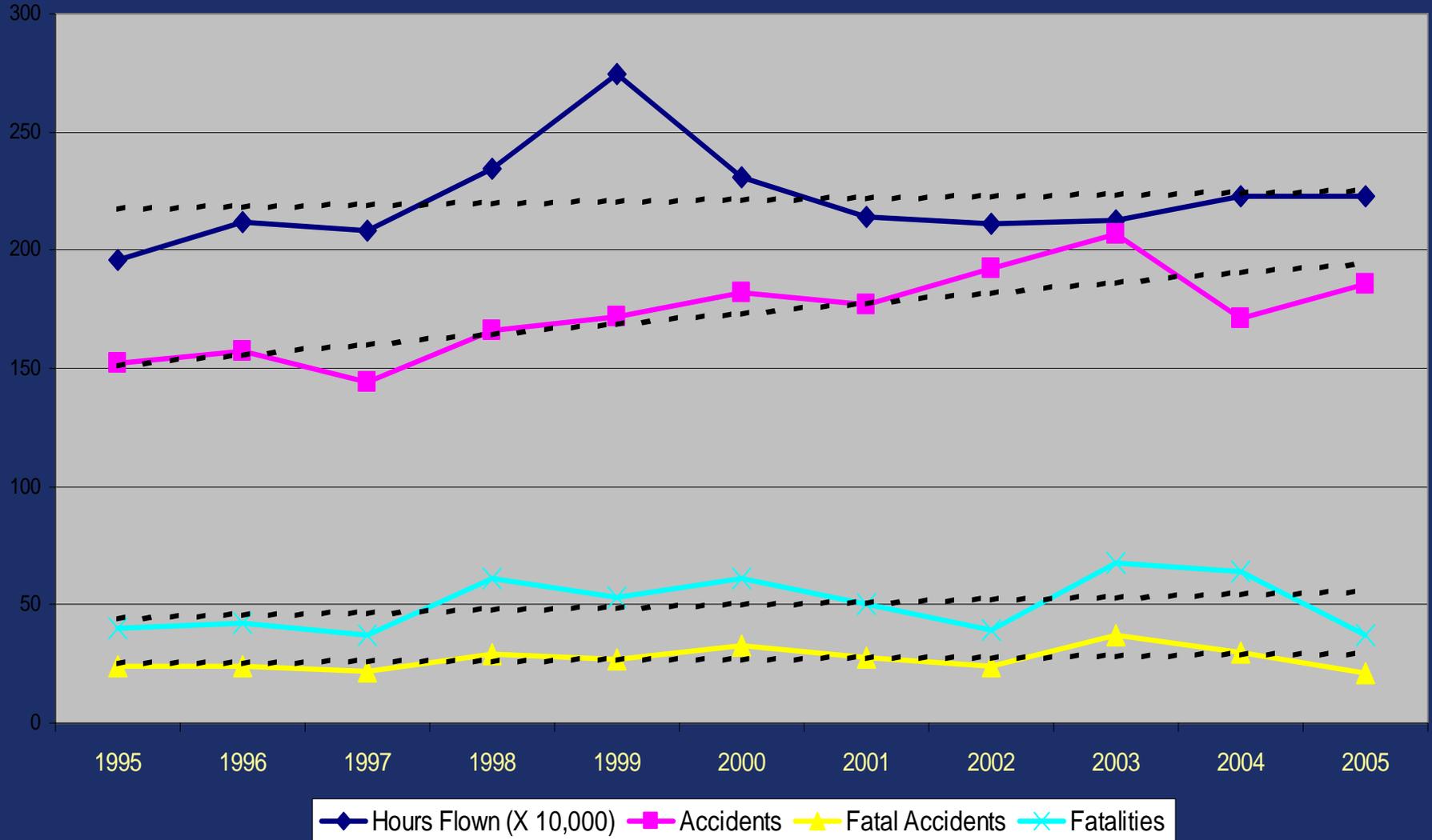
Presentation to: HAI

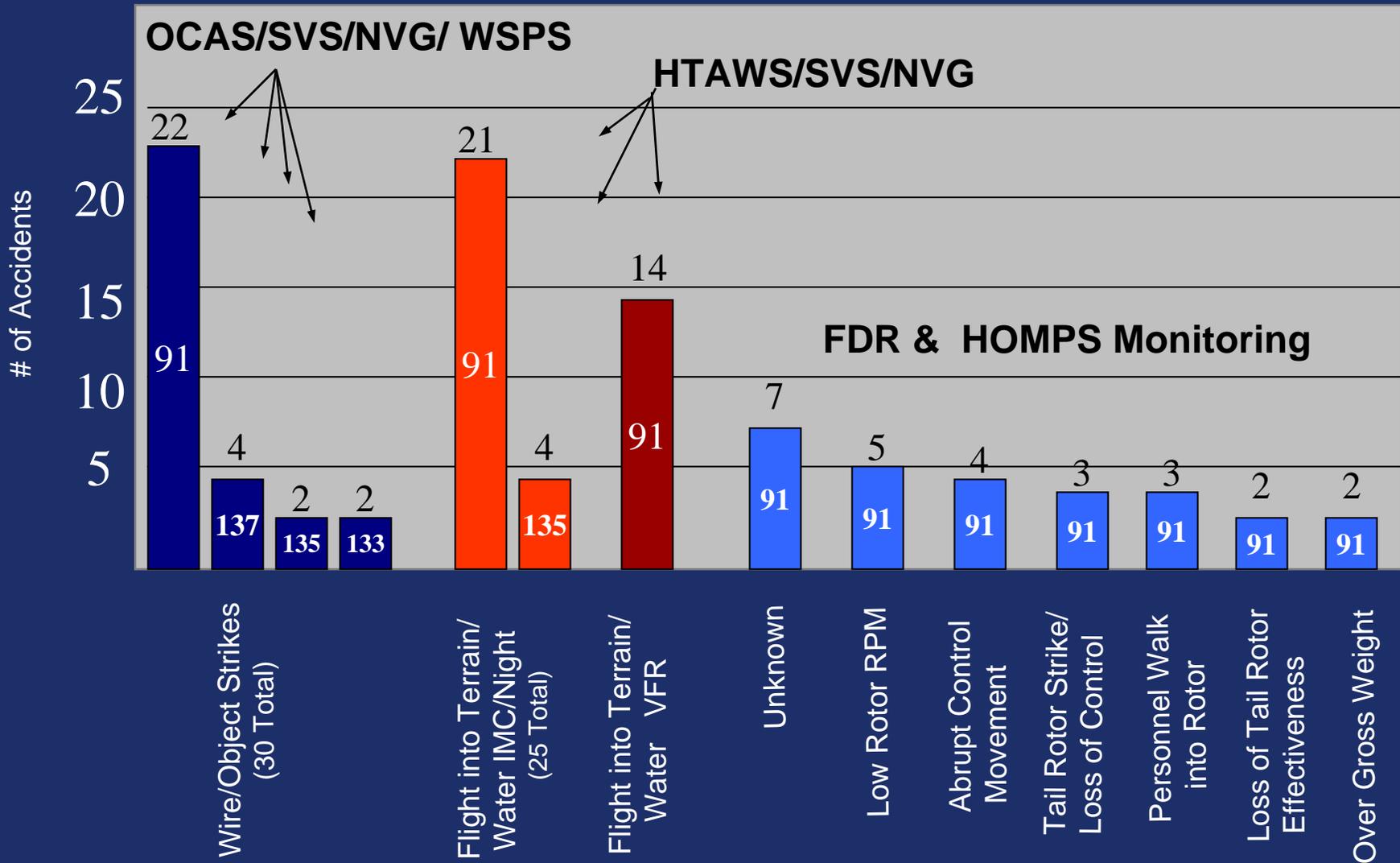
Name: Mathew Rigsby, Rotorcraft
Directorate/ASW-112

Date: 28 Feb 2006



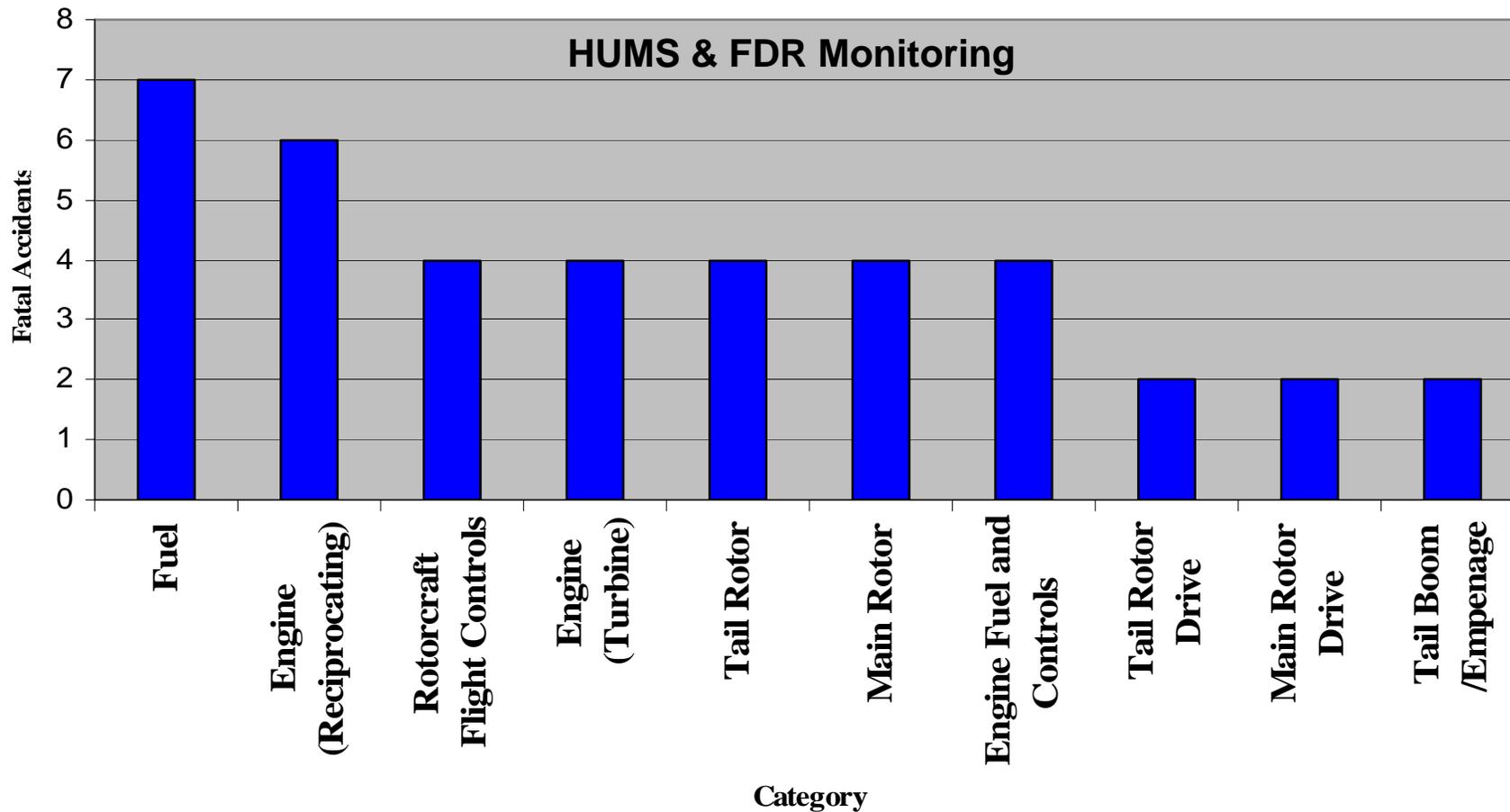
US Civil Type Certificated Rotorcraft Accident Trends 1995- 2005





Data Source: FAA ASAP





Data Source: FAA ASAP (SDR Database)





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NVIS Updates

Presentation to: HAI - 2006

Name: Clark Davenport, Rotorcraft
Directorate/ASW-112

Date: 28 Feb 2006



FAA NVIS Certification Contacts:

- **Clark Davenport**
Human Factors, Rotorcraft Standards Staff
- **Anne Gdfrey**
Test Pilot, ASW170 ACO
- **Jim Arnold**
Flight Test Pilot, Rotorcraft Standards Staff
- **Jeff Trang,**
Flight Test Pilot, Rotorcraft Standards Staff



Overview

- Certification of NVIS Lighting
- Where to Find Assistance



AC 27-1/AC 29-2 MG-16: NVIS

- **NVIS AC Revised**
- **Distributed for FAA Comment**
- **Highlights**
 - Concentration on Aircraft Level Lighting
 - Updated to Include External Lighting
 - Section on Helmets and NVG Mounts



NVG Approval

TSO C-164

- **Stipulates NVGs Must Meet RTCA/DO-275 Requirements**



Certification of NVIS Lighting

- **STC Application**
- **Compliance with 14 CFR Part 27/29 Lighting**
- **Additional Evaluation for NVG Compatibility**
 - Day/Night Ground Evaluation
 - Day Reconn Flight
 - Night Flight



Lessons Learned

- **FAA Finding Compliance to 14 CFR**
NOT Mil-Specs
- **NVIS Lighting Will Provide as Good or Better Functionality of Standard Lighting System**
 - NVIS Green May Wash out Gauge Markings
- **External Lighting:**
 - Technology Allowing for Affordable Reliable Lights
- **Overlays Blocking Light or Visibility**



Lessons Learned

- **Reflections Picked up by NVG**
 - Filtered Equipment
 - External Lighting
 - Interior Reflections
- **Standard Color for Red/Yellow**
 - Use of NVIS Red for CAWS
 - Standard Red for Other Warnings
 - Daylight Readability



Assistance Contacts

- **Clark Davenport (817) 222-5151**
 - Clark.davenport@faa.gov
- **Jim Arnold (817) 222-5126**
 - James.R.Arnold@faa.gov
- **Jeff Trang (817) 222- 5135**
 - Jeff.trang@faa.gov
- **Anne Godfrey (817) 222-5173**
 - Anne.m.godfrey@faa.gov



Assistance

- **NVIS Evaluation Checklists**
 - [http://www.faa.gov/aircraft/air_cert/design_approvals/ rotorcraft/nvis/](http://www.faa.gov/aircraft/air_cert/design_approvals/rotorcraft/nvis/)





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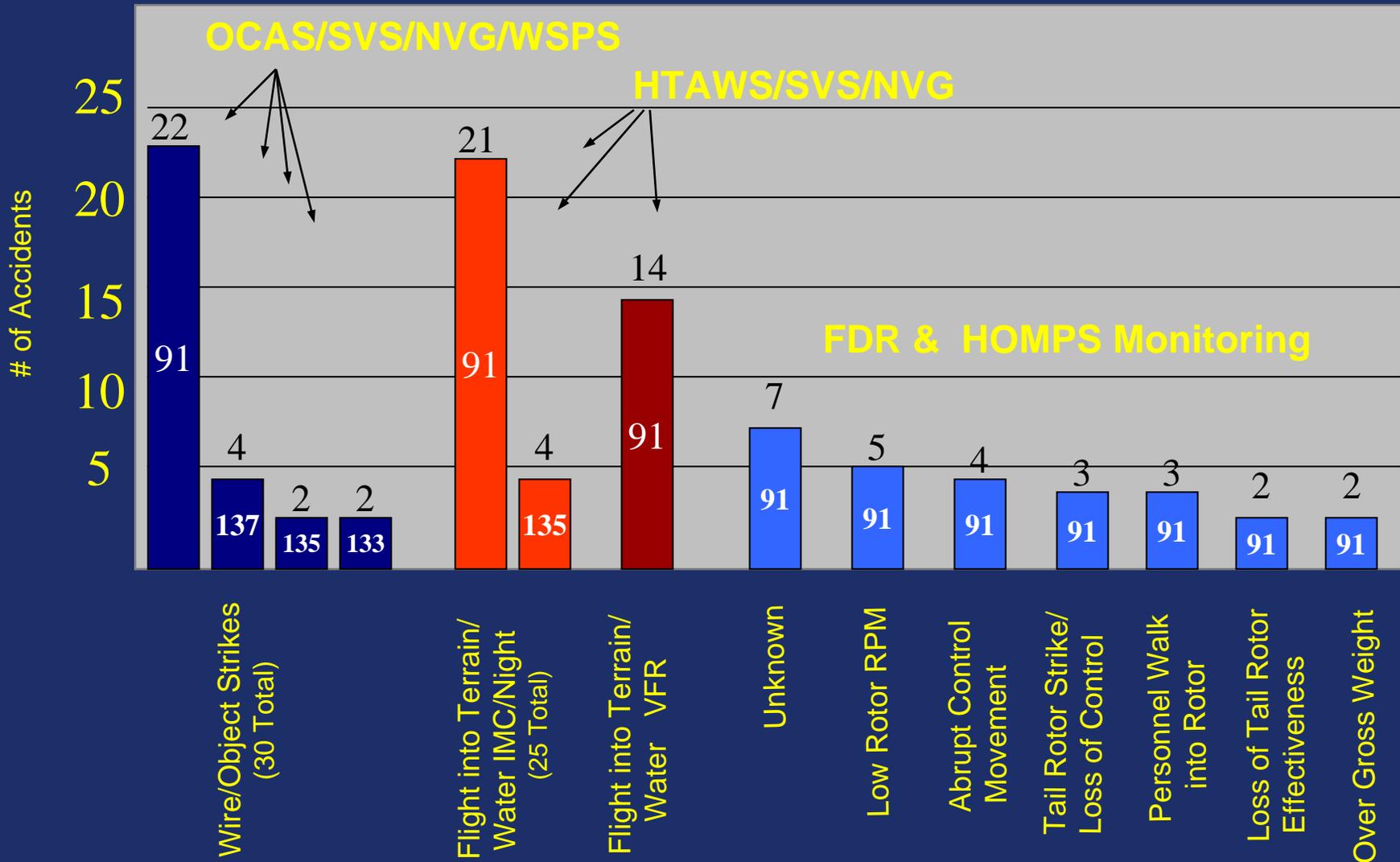
HTAWS

Presentation to: HAI - 2006

Name: James Arnold, Rotorcraft
Directorate/ASW-111

Date: 28 Feb 2006





Data Source: FAA ASAP



CERTIFICATION GUIDANCE

- **Advisory Circular AC 27-1B**
 - AC 27 MG 18 Helicopter Terrain Awareness and Warning System (HTAWS) *Upcoming Change 2 update*
- **Advisory Circular AC 29-2C**
 - AC 29 MG 18 Helicopter Terrain Awareness and Warning System (HTAWS) *Upcoming Change 2 update*
- **TSO – 151b Terrain Awareness and Warning System**
 - *Considerations to TSO requirements for Helicopter Installations contained in AC 29 MG 18 guidance*



SYNTHETIC VISION SYSTEM





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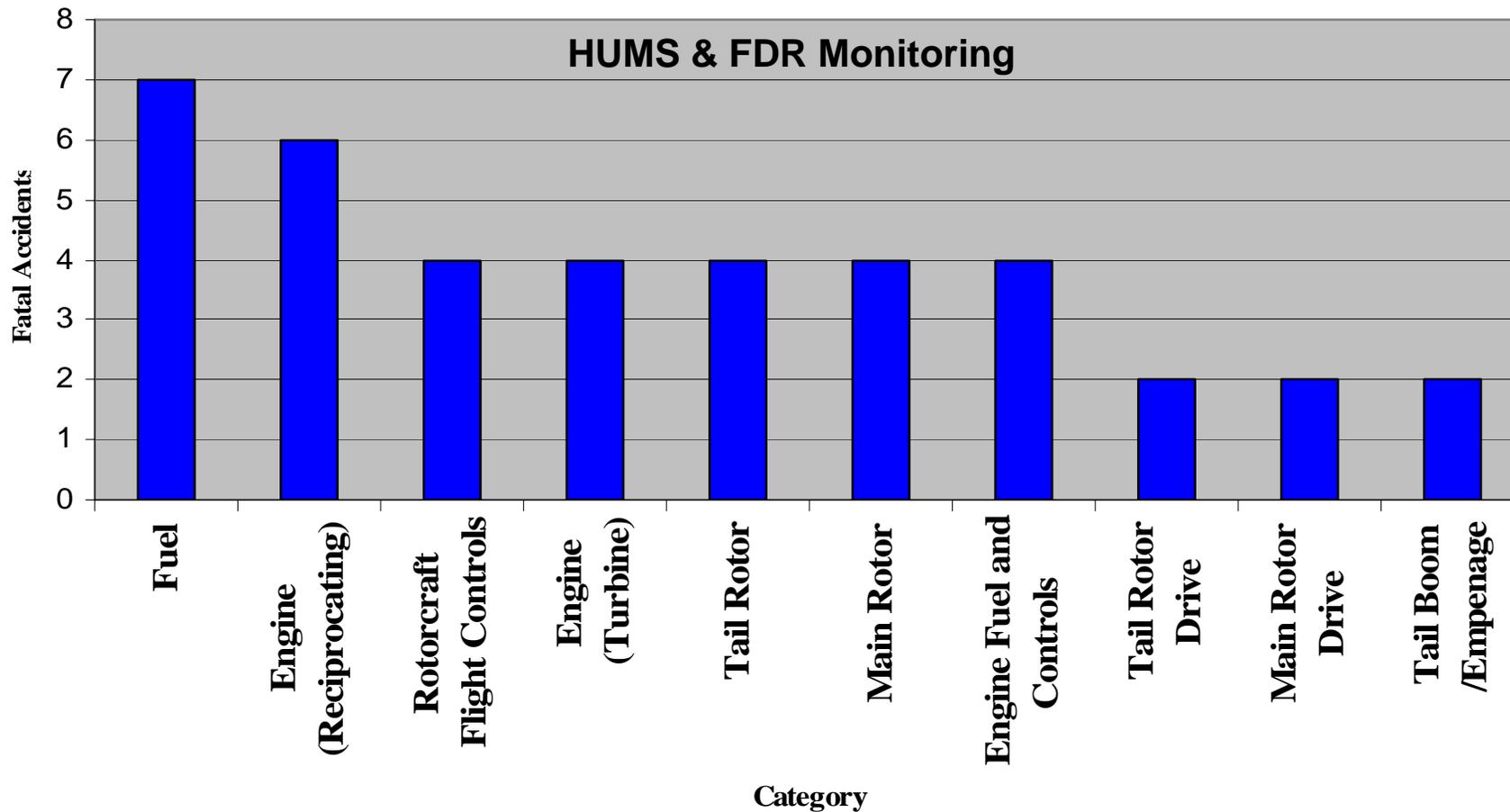
HEALTH USAGE MONITORING SYSTEM (HUMS)

Presentation to: HAI - 2006

Name: Jorge Castillo, Rotorcraft
Directorate/ASW-111

Date: 28 Feb 2006





Data Source: FAA ASAP (SDR Database)



FAA REGULATIONS

- HUMS is not a required system per the regulations.
- FAA HUMS Advisory Circular (AC) provides guidance for HUMS installations via STC, TC.
- AC requires HUMS application for which “CREDIT” is sought to be validated.
- “CREDIT” is a HUMS application that adds to, replaces, or intervenes in industry accepted maintenance practice or flight operations



FAA ADVISORY CIRCULAR (AC)

- AC 29-2C & 27-1B, Change 1, Section MG 15:
Provides a method of showing compliance to regulations for HUMS installations.
- AC Developed By Rotorcraft Health Usage Monitoring System Advisory Group (RHUMSAG)
- Committee Members: FAA Certification & Flight Standards, European Joint Airworthiness Authorities (JAA), US & European Industry Groups (AIA & AECMA)



CERTIFICATION APPROACH

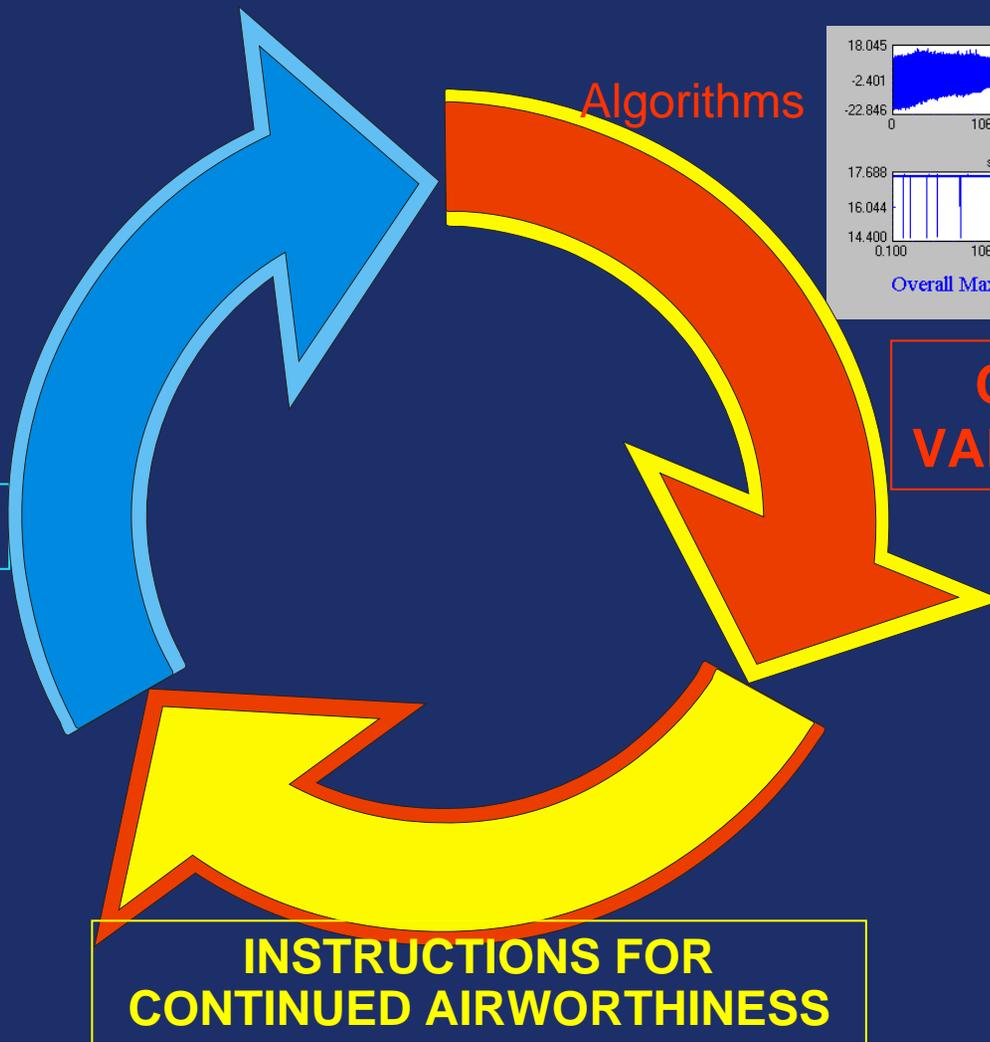


Onboard Systems

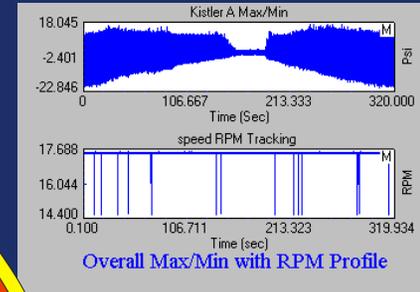
INSTALLATION



Sensors



Algorithms



**CREDIT
VALIDATION**



Hardware
And
Software

**INSTRUCTIONS FOR
CONTINUED AIRWORTHINESS**

Maintenance and
Support System
Interface



Additional Presentation Material

- http://www.faa.gov/aircraft/air_cert/design_approvals/rotorcraft
 - Can find this HAI “FAA Listening Session” Presentation and the following material:
 - NVIS Evaluation Checklists
 - HTAWS
 - HUMS
 - FAA Helicopter Safety Questionnaire

